IN THE SPECIFICATION:

Please replace the abstract of the disclosure with the following paragraph:

Method and apparatus for predicting surface multiples, which includes (a) selecting a target subsurface line (SSL); (b) selecting an input SSL within an aperture of the target SSL; (c) selecting a point on a line twice the distance between the input SSL and the target SSL, the point corresponding to a potential downward reflection point of the surface multiples for a trace; (d) generating a potential surface multiple for the trace corresponding to the point; (e) repeating steps (c) through (d) for each point on the line to generate an inline of potential surface multiples corresponding to each point on the line; (f) repeating steps (b) through (e) for each input SSL within the aperture of the target SSL to generate potential surface multiples for the trace corresponding to each input SSL within the aperture; and (g) adding the potential surface multiples to generate a surface multiple for the trace.

Please replace paragraph [0036] with the following amended paragraph:

[0036] At step 450, a two-dimensional (2-D) surface multiple prediction is performed on the input SSL 320 to generate a sum of all potential surface multiples on an inline (corresponding to input SSL 320) in every MCG that corresponds to target SSL 310. In this manner, every MCG that corresponds to target SSL 310 has been partially computed and summed in the inline direction corresponding to input SSL 320. Step 450 is configured to perform all the operations of steps 220, 230, 235, 250, 255, 265 and 280. The 2-D surface multiple prediction may be performed using existing code and algorithms generally known by persons of ordinary skill in the art, with only minor modifications, if any. In this manner, a portion of the 3-D surface multiple prediction may be computed using existing 2-D surface multiple prediction algorithms applied to data from a single SSL, thereby making the process very efficient. Existing 2-D surface multiple prediction algorithms generally include a geometric spreading compensation correction to condition the data for a 2-D surface multiple prediction, and a rho-filter appropriate to a 2-D summation of the MCGs. Accordingly, in one embodiment of the invention, the geometric spreading correction is not to be applied, and the rho-filter is replaced with one configured for a 3-D surface multiple prediction.

Please replace paragraph [0030] with the following amended paragraph:

[0030] At step 260, a determination is made as to whether another input SSL (e.g., input SSL 350) exists within the aperture [[300]]330. If the answer is in the affirmative, then processing returns to step 230 where a point X on another locations-for-X line (e.g., locations-for-X line 360) is selected. The input SSL 350 is separated from the target SSL 310 by another distance, e.g., y_2, and the locations-for-X line 360 is separated from the target SSL 310 by a distance of $2y_2$. At the end of step 255 for the input SSL 350, another inline of potential surface multiples for trace (S, R) is created in the MCG. Steps 230 through 255 are repeated until all the input SSL's within the aperture 330 have been processed. At the end of step 260, the MCG is filled with inlines of potential surface multiples for trace (S, R) corresponding to all potential downward reflection points within the aperture 330. If the answer to the query at step 260 is in the negative, then processing continues to step 265.

Please replace paragraph [0037] with the following amended paragraph:

[0037] At step 460, a determination is made as to whether another input SSL (e.g., input SSL 350) exists within the aperture [[300]]330. If the answer is in the affirmative, then processing returns to step 440, where the differential moveout correction is applied to every trace on input SSL 350. At the end of step 450 for input SSL 350, the inline sums of all potential surface multiples on another inline (corresponding to the input SSL 350) in every MCG corresponding to target SSL 310 will have been computed. Steps 440-450 are repeated until all the input SSL's within the aperture 330 have been processed. Thus, at the end of step 460, a series of sums of all potential surface multiples on every inline in every MCG corresponding to target SSL 310 has been generated. That is, for every trace on target SSL 310, the inline sums in the MCG for that trace have been computed for each inline within the aperture 330. If the answer to the query at step 460 is in the negative, then processing continues to step 470.

Please replace paragraph [0018] with the following amended paragraph:

[0018] Figure 3 illustrates a top view of a specific trace on the target SSL for which the surface multiples are to be predicted in accordance with one embodiment of the invention.